# CURRICULUM VITAE

**(Chronological)**

**NAME**: Theodore J. Burkey **DEPARTMENT**: Chemistry **RANK**: Professor

## DEGREES

| DEGREE | DISCIPLINE | INSTITUTION | YEAR |
|---|---|---|---|
| B.S. | Chemistry | Harvey Mudd College | 1976 |
| Ph.D. | Chemistry | University of California, San Diego | 1982 |

## EXPERIENCE

| RANK/POSITION | DEPARTMENT/DIVISION | INSTITUTION/COMPANY/ORG | PERIOD |
|---|---|---|---|
| Research Associate | Hydrocarbon Research | National Research Council Canada | 2/82-7/84 |
| Research Associate | Chemistry | Louisiana State University | 8/84-7/85 |
| Assistant Professor | Chemistry | The University of Memphis | 8/85-7/90 |
| USAF-UES Summer Research Fellow | F. J. Seiler Laboratory | USAF Academy | 6/90-8/90 |
| USAF-RDL Summer Research Fellow | Wright Laboratories | Eglin Air Force Base | 6/92-7/92 |
| Associate Professor | Chemistry | The University of Memphis | 8/90-8/05 |
| Interim Chair | Chemistry | The University of Memphis | 11/00-6/02 |
| Professor | Chemistry | The University of Memphis | 9/05- |
| First Tennessee Professor | Chemistry | The University of Memphis | 9/08-8/11 |

## HONORS/AWARDS

| HONOR/AWARD | INSTITUTION/COMPANY/ORGANIZATION | YEAR |
|---|---|---|
| Who's Who of American Colleges and Universities | Harvey Mudd College | 1976 |
| Superior Performance in University Research | The University of Memphis | 1992 |
| Outstanding Environmental Health and Safety Award | The University of Memphis | 2002 |
| First Tennessee Professorship | The University of Memphis | 2008 |

## TEACHING EXPERIENCE: *(Specific information for past two years summarized in Appendix A. Use Appendix A to elaborate on teaching experience as needed.)*

| SUBJECT *(indicate Undergraduate (U), Graduate (G), Other)* | INSTITUTION |
|---|---|
| Organic Chemistry I (U) | The University of Memphis |
| Organic Chemistry II (U) | The University of Memphis |
| Molecular Spectroscopy | The University of Memphis |
| Molecular Spectroscopy Lab | The University of Memphis |
| Advance Organic Chemistry: Structure and Reactivity (G) | The University of Memphis |
| Organic Chemistry I Lab Supervisor (G) | The University of Memphis |
| Chemistry Literature and Seminar (U & G) | The University of Memphis |
| Fourier Transform NMR Spectroscopy (G) | The University of Memphis |
| Intermediate Organic Chemistry ( U & G) | The University of Memphis |
| Instrumental Analysis (U) | The University of Memphis |

| | |
|---|---|
| Photochemistry (G) | The University of Memphis |
| Teaching Chemistry Laboratories (G) | The University of Memphis |
| Chemical Research (U & G) | The University of Memphis |

## STUDENT ADVISING/MENTORING: *(Use Appendix B to elaborate on advising/mentoring)*

**Students involved in scholarly (research, creative) activities directly supervised (committees chaired).**

**Undergraduate 0, Masters 0, Doctoral 2, Postdoctoral 0**

| Current | Name | Year of graduation (anticipated) |
|---|---|---|
| Graduate | Karen Mosley | 2012, PhD |
| Graduate | Jermaine Johnson | 2014, PhD |
| Graduate | Phil Lubet | 2012, MS |
| Graduate | Thomas McFadden | 2016, PhD |
| Graduate | Margaret Owens | 2017, PhD |

**Number of current Committee memberships (other than those chaired): Masters _____, Doctoral 2.**
**Number of students currently advised: Undergraduate 5, Graduate 5**

## RESEARCH/SCHOLARSHIP/ CREATIVE ACTIVITIES: *(use Appendix C to provide additional information as needed.)*

### PUBLICATIONS (authors, title, reference) Include material in press and accepted for publication.

**Refereed journal publications (include book chapters)**

1. T. J. Burkey and R. C. Fahey, "Equilibrium Studies of Water Addition to Ketones: Substituent and Solvent Effects for Methyl Ketones", *J. Am. Chem. Soc.*, **1983**, *105*, 868-871.
2. T. J. Burkey, A. L. Castelhano, D. Griller, and F. P. Lossing, "Heats of Formation and Ionization Potentials of Some alpha-amino Radicals", *J. Am. Chem. Soc.*, **1983**, *105*, 4701-4703.
3. T. J. Burkey, D. Griller, L. Lunazzi, and A. S. Nazran, "Homolytic Substitution at Furan and Thiophene: Rate Constants for the Formation and Decay of Radical Intermediates", *J. Org. Chem.*, **1983**, *48*, 3704-3707.
4. T. J. Burkey, and D. Griller, "Modulation Spectroscopy: A New Technique for the Study of Free Radicals in Solution", *Rev. Chem. Interm.*, **1984**, *5*, 21.
5. T. J. Burkey, D. Griller, D. A. Lindsay, and J. C. Scaiano, "A Simple Method for Quantifying the Distribution between Micellar and Aqueous Phases of Sodium Dodecyl Sulfate Solutions", *J. Am. Chem. Soc.*, **1984**, *106*, 1983-1985.
6. T. J. Burkey and R. C. Fahey, "Equilibrium Studies of Water and 3-Mercaptopropanoic Acid Addition to Ketones", *J. Org. Chem.*, **1985**, *50*, 1304-6.
7. T. J. Burkey and D. Griller, "Micellar Systems as Devices for Enhancing the Lifetimes and Concentrations of Free Radicals", *J. Am. Chem. Soc.*, **1985**, *107*, 246-249.
8. T. J. Burkey, D. Griller, R. Sutcliffe, and C. J. Harding, "Inversion Barrier of the Cycloheptyl Radical", **J. Org. Chem.*, **1985**, *50*, 1138-1140.
9. T. J. Burkey, M. Majewski, and D. Griller, "Heat of Formation of the t-Butoxytriphenylphosphoranyl Radical", *J Chem. Soc. Chem. Comm.*, **1985**, 1259-1260.
10. T. J. Burkey, J. Lusztyk, K. U. Ingold, J. K. S. Wan, and F. J. Adrian, "Chemically Induced Dynamic Electron Polarization of the Diethoxyphosphonyl Radical: A case of Mixed S-$T_0$, S-T-Radical Pair Polarization" *J. Phys. Chem.*, **1985**, *89*, 4286-91.

11. T. J. Burkey, J. A. A. Hawari, F. Lossing, J. Lustyk, R. Sutcliffe, and D. Griller, “The tert-Butyl Perthiyl Radical”, *J. Org. Chem.* **1985**, *50*, 4966-4967.

12. T. J. Burkey, M. Majewski and D. Griller, “Heats of Formation of Radicals and Molecules by a Photoacoustic Technique” *J. Am. Chem. Soc.* **1986**, *108*, 2218-2221.

13. J. M. Morse, Jr., G. H. Parker, T. J. Burkey, "The Enthalpy of CO Dissociation of $M(CO)_6$ (M = Cr, Mo, W) in Alkanes: Determination of Intermolecular Agostic Bond Strengths," *Organometallics*, **1989**, *8*, 2471-2474.

14. T. J. Burkey, "Photoacoustic Calorimetry Studies of Ligand-Exchange of Aliphatic Amines with $Cr(CO)_6$: Steric Effects and Hydrogen Bonding", *Polyhedron*, **1989**, *8*, 2681-2687.

15. Daniel Church, T. J. Burkey, and William A. Pryor, "Preparation of Human Lung Tissue from Cigarette Smokers for Analysis by Electron Spin Resonance Spectroscopy" submitted for publication in "Methods in Enzymology Volume 186, Oxygen Radicals in Biological Systems, Part B: Oxygen Radicals and Antioxidants", Academic Press, 1990, p 665-669.

16. T. J. Burkey, "Thermochemistry of Silane Substitution on CO on Metal Carbonyl Compounds: Interaction of Silanes with Metal Centers", *J. Am. Chem. Soc.* **1990**, *112*, 8329-8333.

17. S. K. Nayak and T. J. Burkey "Low Quantum Yields of $Cr(CO)_6$ Substitution in Fluorocarbon Solvent: Evidence that Metal-Fluorocarbon Interactions are Weak", *Organometallics* **1991**, *10*, 3745-3750.

18. T. J. Burkey, "Solution Thermochemistry of Organometallic Compounds using Photoacoustic Calorimetry: Enthalpies of Ligand Exchange, Metal-Ligand Bonds, and Metal-Solvent Interactions," In *Energetics of Organometallic Species*; J. A. Martinho Simoes, Ed.; Nato ASI Series C:367; Kluwer: Dordrecht, 1992, pp 75-94.

19. S. K. Nayak and T. J. Burkey "Photosubstitution of $Fe(CO)_5$ with $PEt_3$ in Cyclohexane: $Fe(CO)_4PEt_3$ and $Fe(CO)_3(PEt_3)_2$ are Single-Photon Products", *Inorganic Chemistry,* **1992**, *31*, 1125-1127.

20. S. K. Nayak and T. J. Burkey, "Photosubstitution of Iron Carbonyl Phosphine Complexes: Quantum Yields, Kinetic and Thermochemical Studies," *J. Am. Chem. Soc.* **1993**, *115*, 6391-6397.

21. S. K. Nayak, G. J. Farrell and T. J. Burkey, "The Photosubstitution of Two Iron Pentacarbonyl CO's in Solution Via a Single Photon Process: Dependence on Dispersed Ligands and the Role of Triplet Intermediates," *Inorg. Chem.* **1994**, *33*, 2236-2242.

22. S. Hu., G. J. Farrell, C. Cook, R. Johnston, T. J. Burkey, "Rearrangement of $\eta^5$-Cp-$Mn(CO)_2$ ($HSiEt_3$)): A Missing Step in the Energy Surface for the Oxidative Addition of Silane to $CpMn(CO)_2$(heptane)," Organometallics **1994**, *13*, 4127-4128.

23. G.-L. Leu and T. J. Burkey, "Alkane Coordination by Molybdenum and Chromium Pentacarbonyls: An Examination of the Energetics of Intermolecular Agostic Bonding," *J. Coord. Chem.* **1995**, *34*, 87-97.

24. D. Pace, L. Fan, and T. J. Burkey, “Free radicals From Photolysis of (NTO) 5-Nitro-2,4-dihydro-3H-1,2,4-Triazol-3-one studied by EPR Spin Trapping,” Proceedings of the MRS Meeting, 1995, p. 127-133.

25. L. Fan, C. Dass, and T. J. Burkey, “Synthesis and Thermal Decomposition of $^{15}$N-Labelled NTO," J. Labelled Cmpds. and Radiopharm. **1996**, *38*, 87-94.

26. T. R. Botcher, D. J. Beardall, C. A. Wight, L. Fan, and T. J. Burkey, “Thermal Decomposition Mechanism of NTO”, J. Phys. Chem. **1996**, *100*, 8802-8806.

27. Z. Pang, T. J. Burkey, and R. F. Johnston, “Design of Transition Metal Complexes with High Quantum Yields for Ligand Substitution: Efficient Photochemical Chelate Ring Closure in Cyclopentadienyl-manganese Tricarbonyl Derivatives,” *Organometallics* **1997**, *16*, 120-123.

28. T. Jiao, Z. Pang, T. J. Burkey, R. F. Johnston, T. A. Heimer, V. D. Kleinman, and E. J. Heilweil, "Ultrafast Ring Closure Energetics and Dynamics of Cyclopentadienyl Manganese Tricarbonyl Derivatives" *J. Am. Chem. Soc*. **1999**, *121*, 4618-4624.

29. J. A. Daffron G. J. Farrell, and Theodore J. Burkey **"**High-Pressure Photoacoustic Calorimetry" *Rev. Sci. Instrum*. **2000**, *71*, 3882-3885.

30. G. J. Farrell and T. J. Burkey, "High-Pressure Photoacoustic Calorimetry of Chromium Hexacarbonyl: Volumes of Heptane Displacement at Chromium Pentacarbonyl Heptane" *J. Photochem. Photobiol.* A: Chemistry, **2000**, *137*, 135-139.

31. T .J. Jiao, G.-L. Leu, G. J. Farrell and T. J. Burkey, "Photoacoustic Calorimetry and Quantum Yields of $Mo(CO)_6$ Ligand Exchange in Linear Alkanes: Determination of Volume of Reaction, Energetics, and Kinetics of Nucleophile Displacement of Alkane from $Mo(CO)_5$(Alkane)" *J. Am. Chem. Soc*. **2001**, *123*, 4960-4965.

32. S. Gittermann, T. Jiao and T. J. Burkey "Volume of Reaction, Energetics, and Kinetics of Tetrahydrothiophene Displacement of Solvent from $Mo(CO)_5$(alkane)", *Photochem. Photobiol. Sci*. **2003**, *2*, 817-820.

33. J. S. Yeston, T. T. To, T. J. Burkey, E. J. Heilweil, "Ultrafast Chelation Dynamics of Cyclopentadienyl Manganese Tricarbonyl Derivatives with Pendant Sulfides", *J. Phys. Chem B*. **2004**, *108*, 4582-4585.

34. T. T. To, C. E. Barnes, and T. J. Burkey "Bistable Photochromic Organometallics Based on Linkage Isomerization: Photochemistry of Dicarbonyl($\eta^5$-methylcyclopentadienyl)manganese(I) derivatives with a Bifunctional, Non-Chelating Ligand", *Organometallics*, **2004**, *23*, 2708-2714.

35. K. M. McCauley, D. A. Pratt, S. R. Wilson, J. Shey, T. J. Burkey, W. A. van der Donk, "Properties and Reactivity of Chlorovinylcobalamin and Vinylcobalamin and Their Implications for Vitamin B12-Catalyzed Reductive Dechlorination of Chlorinated Alkenes", *J. Am. Chem. Soc.* **2005**, *127*, 1126-1136.

36. T. T. To, E. J. Heilweil, and T. J. Burkey, "Time-Resolved Infrared Absorption Study of Cyclopentadienyl Manganese Tricarbonyl Derivatives: Chelation of Pendant Sulfides in Acetonitrile", *J. Phys. Chem A* **2006**, *110*, 10669-10673.

37. C. B. Duke III, C. Ross II and T. J. Burkey. "[$\eta^6$-2-Benzoyl-2-(1,2-dihydropyridin-2-ylidene)acetonitrile] tricarbonylchromium(0)", Acta Crystallographica E, **2006**, *E62*, m2086-m2088.

38. To, Tung T.; Duke, Charles B., III; Burkey, Theodore J.; Heilweil, Edwin J. "Ultrafast chelation dynamics of model photoswitches: cyclopentadienyl manganese and arene chromium tricarbonyl derivatives with pendant sulfides"**.** Springer Series in Chemical Physics (2007) 88 261-263.

39. T. T. To, E. J. Heilweil, C. B. Duke III and T. J. Burkey "Solvent and Structural Effects on Ultrafast Chelation Dynamics of Arene Chromium Tricarbonyl Sulfide Derivatives" *J. Phys. Chem. A.* **2007***,* 111*, 6933-6937.*

40. C. B. Duke, T. T. To, C. R. Ross and T. J. Burkey "{$\mu$ -1,1'-[2-Cyano-2-(2-pyridyl)propane-1,3-diyl]di-$\eta^5$-cyclopentadienyl}bis[tricarbonylmanganese(II)]." Acta Crystallographica E, **2007**, *E63*, m1848-m1849.

41. T. T. To, C. B. Duke III, C. S. Junker, C. O'Brien, C. R. Ross II, C. E. Barnes, C. E. Webster, T. J. Burkey, "Linkage Isomerization as a Mechanism for Photochromic Materials: Cyclopentadienylmanganese Tricarbonyl Derivatives with Chelatable Functional Groups". *Organometallics*, **2008**, *27*, 289-298.

42. Y. Z. Hamada, H. Holyfield, K. Rosli, T. Burkey, "Equilibrium models of $Cr^{3+}$ and $Cu^{2+}$ with Glutamate" *J. Coord. Chem*. **2009**, 62, 721-733.

43. **Invited centennial article:** T. T. To, E. J. Heilweil, K. R. Ruddick, C. E. Webster, C. B. Duke III, and T. J. Burkey, "The Development of Ultrafast Photochromic Organometallics and Photoinduced Linkage Isomerization of Arene Chromium Carbonyl Derivatives", *J. Phys. Chem. A* **2009**, *113*, 2666-2676.

44. C. B. Duke, C. R. Ross II, and T. J. Burkey "Tricarbonyl(2-methyl-2-$\eta^6$-phenyl-1,3-dioxolane)chromium(0)" Acta Crystallographica Section E: Structure Reports Online, (2010) Volume 66, Part 2, pages m148.

45. M. M. Mecwan, T. Burkey, S. R. Mishra, W. O. Haggard, J. D. Bumgardner, "Effect of molecular weight of chitosan degraded by microwave irradiation on bone tissue engineering applications" *Trans. Ann. Soc. Biomat.* **2010**, 32 (Annual Meeting of the Society for Biomaterials: Giving Life to a World of Materials, 2010, Volume 2), 714.

46. S. M. Gittermann, R. G. Letterman, T.-J. Jiao, G.-L. Leu, N. J. DeYonker, C. E. Webster, and T. J. Burkey "Bond Energies, Reaction Volumes, and Kinetics for $\sigma$ and $\pi$ Complexes of $Mo(CO)_5L$", *J. Phys. Chem. A*, **2011**, *115*, 9004–9013.

47. E. J. Heilweil, J. O. Johnson, K. L. Mosley, P. P. Lubet, C. E. Webster, T. J. Burkey, "Engineering Femtosecond Organometallic Chemistry: Photochemistry and Dynamics of Ultrafast Chelation of Cyclopentadienylmanganese Tricarbonyl Derivatives with Pendant Benzenecarbonyl and Pyridinecarbonyl Groups" *Organometallics*, **2011**, *30*, 5611-5619. **10.1021/om2003656**

48. Y. Z. Hamada, T. J. Burkey, E. Waddell, M. Aitha, N. Phambu, "Reactions of $Zn^{2+}$, $Cd^{2+}$ and $Hg^{2+}$ with free adenine" *J. Appl. Sol. Chem. Model* **2013**, *2*, 77-84.

49. Charles B. Duke III, Roger G. Letterman, Jermaine O. Johnson, James W. Barr, Songnan Hu, Charles R. Ross II, Charles Edwin Webster, and Theodore J. Burkey, "Photochemistry of Arene Chromium Tricarbonyl

Complexes with Tethered Pyridinyl and Propenyl Groups: Investigations of Chelate Formation, Structure, and Linkage Isomerization" *Organometallics*, **2014**, *33*, 485-497. dx.doi.org/10.1021/om400928k

50. Roger G. Letterman, Charles B. Duke III, Tung T. To, Theodore J. Burkey, and Charles Edwin Webster, "Degenerate Pathways for Metallacycle Ring Inversions: A Common Phenomenon Consistent with the Principle of Microscopic Reversibility" *Organometallics*, **2014**, *33*, 5928-5931. dx.doi.org/10.1021/om5007165.

51. Kristy M. DeWitt, Tung T. To, Edwin J. Heilweil, Theodore J. Burkey "Linkage Isomerization via Geminate Cage or Bimolecular Mechanisms: Time-Resolved Investigations of an Organometallic Photochrome" *J. Phys. Chem. B*, **2015**, *119*, 5531-5536. DOI: 10.1021/jp513033j

## PRESENTATIONS (authors, title, reference)

### INVITED PRESENTATIONS

#### Conferences and Symposia

September 1991 "Solution Thermochemistry of Organometallic Compounds: Enthalpies Ligand Exchange, Metal-Ligand Bonds, and Metal-Solvent Interactions" NATO Advanced Study Institute: Energetics of Organometallic Species, Curia, Portugal.

September 1991 "Tutorial on Photoacoustic Calorimetry" Curia, Portugal, NATO Advanced Study Institute on Energetics of Organometallic Species.

November 1994 "Energetic and Kinetic Studies of the Reaction of Nucleophiles with Organometallic Transients: Fluorocarbons to Phosphines." Symposium on Organotransition Metal Intermediates, Southwest ACS Regional Meeting, Forth Worth, Texas.

June 1997 'Photochromic Materials for Optical Memory: Design and Study of Organometallic Models" NSF Workshop on Inorganometallic Chemistry, Santa Fe, Mew Mexico.

May 1998 "Designing Molecular Switches Based on Organometallics with High Quantum Yields for Substitution" J. J. Zukerman Organometallic Chemistry Workshop, University of Oklahoma, Norman, Oklahoma.

October 1999 "Designing Photosensitive Organometallics for Molecular Devices" 51$^{st}$ ACS Southeast Regional Meeting, Symposium on Organometallic Materials and Organometallic Chemistry, Knoxville, TN.

February 2006 "Photoacoustic calorimetry – a path to solution phase bond energies" Mesilla Workshop on Organometallic complexes: Energetics – Solvation – Reactions, Mesilla, New Mexico.

August 2011 "Engineering Femtosecond Chemistry for the Development of Efficient Organometallic Photochromes" Theodore J. Burkey, Edwin J. Heilweil, Charles Edwin Webster, Karen Mosley, Jermaine Johnson, James Barr, XXV International Conference on Photochemistry, Beijing, China.

July 2012 "Engineering Organometallic Photochromes Based on Linked Functional Groups." Ted Burkey, Telluride Science Research Center, Telluride, CO.

November 2012 "Challenges for a Successful Project SEED Experience: Identifying Promising Students and Projects" Ted Burkey, 64th Southeast Regional Meeting of the American Chemical Society, Raleigh, NC, United States,SERM-1274.

July 2014 Telluride,

November 2014 "Photochemistry: Fundamentals and Applications in Materials" Ted Burkey, Undergraduate Workshop on Photocatalysis and Solar Energy Conversion, University of Memphis.

#### Other (universities/industry)

February 1986 "The Thermochemistry of Transient Organometallic and Organic Species and Related Bonds by Photoacoustic Technique", Sixth Annual Undergraduate Chemistry Conference, Memphis State University, Memphis, Tennessee.

February 1986 "Transient Organometallic and Organic Species and Related Bond Energies by Photoacoustic Calorimetry", Sixth Annual Undergraduate Chemistry Conference, Memphis State University, Memphis, Tennessee.

July 1986 "Chemistry and Biochemistry of Cigarette Smoke", Division of Chemistry, National Research Council of Canada, Ottawa, Ontario, Canada.

October 1986 "The Contrary Natures of the Gas and Tar Phases of Cigarette Smoke" Chemistry Department, Memphis State University, Memphis, Tennessee.

October 1986 "The Thermochemistry and Kinetics of Organometallic Transients Using Photoacoustic Calorimetry" Chemistry Department, University of Mississippi, Oxford.

April 1988 "Are Transition-Metal Bond Strengths to Carbon Monoxide greater than to Aliphatic Amines? Chemistry Department, Memphis State University, Memphis Tennessee.

May 1989 "Thermochemistry of Organometallic Reactions: Ligand Dissociation, Ligand Exchange, and Agostic Bonds", Chemistry Department, Auburn University.

August 1989 "Photoacoustic Calorimetry Studies of Organometallic Complexes" Chemistry Department, University of North Texas, Denton, Texas.

November 1989 "Photoacoustic Calorimetry of Organometallic Compounds" Chemistry Department, Rhodes College, Memphis, Tennessee.

March 1990 "Thermochemistry of Metal Carbonyls" Chemistry Department, University of North Texas, Denton, Texas.

July 1990 "Time Resolved Calorimetry: A New Method to Study What's Hot" F. J. Seiler Research Laboratory, USAF Academy.

October 1991 Recent Advances in Organometallic Thermochemistry using Photoacoustic Calorimetry", Department of Chemistry, Memphis State University.

January 1992 "Photoacoustic Calorimetry of Organometallic Compounds" Chemistry Department, University of Southern Mississippi, Hattiesburg, Mississippi.

February 1992 "Photoacoustic Calorimetry", Department of Physics, Memphis State University.

April 1992 "Laser Photoacoustic Calorimetry Studies of Organometallics Species: Metal-Ligand and Metal-Solvent Bond Energies", Department of Chemistry, University Nevada, Reno, Nevada.

July 1992 "Solution Thermochemistry of Organometallic Compounds: Enthalpies Ligand Exchange, Metal-Ligand Bonds, and Metal-Solvent Interactions" Department of Chemistry, Ottawa University, Ottawa, Canada.

November 1992 "Photoacoustic Calorimetry Studies: Energetics of Metal-Ligand and Metal-Solvent Interactions", Department of Chemistry, University of New Orleans, New Orleans, Louisiana.

February 1993 "Energetics and Kinetics of Ligand Exchange of Iron Carbonyl Phosphines Using Pulsed Laser Photoacoustic Calorimetry", Department of Chemistry, University of Missouri at St. Louis, St. Louis, Missouri.

January 1994 "Hydrogen as Fuel" Department of Chemistry, University of Tennessee, Martin, Tennessee.

February 1994 "Energetics and Dynamics of Transient Transition Metal Complexes: Studies in Solution Using Laser Photoacoustic Calorimetry", Fisk University, Nashville, Tennessee.

February 1994 "Energetics and Dynamics of Transient Transition Metal Complexes: Studies in Solution Using Laser Photoacoustic Calorimetry", Oak Ridge National Laboratories, Oak Ridge, Tennessee.

February 1994 "Energetics and Dynamics of Transient Transition Metal Complexes: Studies in Solution Using Laser Photoacoustic Calorimetry", Department of Chemistry, Tennessee Technological University, Cookville, Tennessee.

September 1994 "Little Known Chemistry of Cigarette Smoke", Department of Chemistry, Austin Peay State University, Clarksville, Tennessee.

October 1994 "A Fuel for the Future: Applications, technological Considerations, and Chemistry of Hydrogen Gas." Department of Chemistry, Middle Tennessee State University, Murfreesboro, Tennessee.

October 1994 "Energetic and Kinetic Studies of the Reactions of Nucleophiles with Organometallic Transients: Fluorocarbons to Phosphines", Department of Chemistry, Middle Tennessee State University, Murfreesboro, Tennessee.

October 1994 "Energetic and Kinetic Studies of Solvent Displacement by Nucleophiles on Transient Organometallic Complexes", Department of Chemistry, University of Tennessee, Knoxville, Tennessee.

October 1994 "Hydrogen as a Fuel - Future or Fantasy?", Department of Chemistry, Tennessee Technological University, Cookville, Tennessee.

February 1995 "Kinetic and Energetic Studies of Transition Metal Transients Using a Laser Photoacoustic Technique", Department of Chemistry, Western Kentucky University, Bowling Green, Kentucky.

February 1995 "Reactivity of Transition Metal Transients in Solution: What We Can Learn by Being Good Listeners", Department of Chemistry, University of Texas at Dallas, Arlington, Texas.

November 1995 "Little Known Chemistry of Cigarette Smoke", Department of Chemistry, Arkansas State University, Jonesboro, Arkansas.

January 1996 "Little Known Chemistry of Cigarette Smoke", Department of Chemistry, University of Arkansas, Pine Bluff, Arkansas.

November 1996 "Laser Photoacoustic Calorimetry: Thermochemistry of Ligand Substitution", Department of Chemistry, Hendrix, College, Conway, Arkansas.

January 1997 "Development of Organometallic compounds as Photochromic Materials", Department of Chemistry, Arkansas Tech, MTSU Russelville, Arkansas.

November 1997 “What is a Neurotransmitter and Vasodilator Doing in Cigarette Smoke?” Department of Medicinal Chemistry, University of Mississippi, Oxford, Mississippi.

February 1998 “Developing Photochromic Organometallics for Optical Computer Memory”, Department of Chemistry, University of Central Arkansas, Conway, Arkansas.

October 1998 "Developing Photochromic Organometallics for Optical Computer Memory”, Department of Chemistry, Southern Arkansas University, Magnolia, Arkansas.

October 1998 "Studies of Ultrafast Ring Closure or the Big Bang Approach to Photochemistry"" Department of Chemistry, University of North Texas, Denton Texas.

February 1999 "Reactivity of Transition Metal Transients in Solution: What We Can Learn by Being Good Listeners", Department of Chemistry, St. Louis University, St. Louis, Missouri.

February 1999 **"**Broadband Infrared Spectroscopic Investigations of Electron Transfer, Photochemistry and Biochemistry," Department of Chemistry, U. C. Berkeley, Berkeley, CA. Presented by Dr. Edwin J. Hielweil, Collaborator.

February 1999 "Broadband Infrared Spectroscopic Investigations of Electron Transfer, Photochemistry and Biochemistry," Department of Chemistry, Duke University, Presented by Dr. Edwin J. Hielweil, Collaborator.

October 1999 "Photochromic Materials" Hutchinson School, Memphis, Tennessee.

January 2000 "A Study of Light and Sound: The application of Laser Photoacoustic Calorimetry in the Investigation of Chemical Systems, Physics Department, The University of Memphis.

March 2000 " Creation of Materials with High Reaction Quantum Yields: Development of Compounds for Data Storage " Department of Chemistry, Southern Illinois University, Carbondale, Illinois.

January 2001 "Photochromic Molecular Machines: Designing Materials for Quantum Computers" Department of Chemistry, University of Tennessee, Chattanooga, Tennessee.

February 2001 "Photochromic Molecular Machines: Designing Materials for Quantum Computers" Department of Chemistry, University of South Alabama, Mobile, Alabama.

February 2002 "Photochromic Molecular Machines: Designing Materials for Quantum Computers" Physical Science Department, Lyon College, Batesville, Arkansas.

October 2003 “Photochromic Organometallics: Potential Materials for Molecular Machines and Ultrafast Optical Switches” Chemistry and Physics Department, Arkansas State University, Jonesboro, Arkansas.

November 2003 “Photochromic Organometallics: Potential Materials for Molecular Machines and Ultrafast Optical Switches” Chemistry Department, Murray State University, Murray Kentucky.

November 2003 “Photochromic Organometallics: Potential Materials for Molecular Machines and Ultrafast Optical Switches” Chemistry Department, Kentucky State University, Frankfort, Kentucky.

November 2003 “Photochromic Organometallics: Potential Materials for Molecular Machines and Ultrafast Optical Switches” Chemistry Department, Eastern State University, Richmond, Kentucky.

February 2004 “Photochromic Organometallics: Ultrafast Molecular Machines and Optical Switches”, Department of Chemistry, University of Tennessee, Chattanooga, Tennessee.

October 2005 Bistable Photochromics: Creating Molecular Devices with Sub-Picosecond Response”, Department of Chemistry and Physics, South Eastern Louisiana University, Hammond, Louisiana.

September 2008 “Development of Photochromic Organometallic Compounds”, Department of Chemistry, University of Tennessee, Chattanooga, Tennessee

May 2009 “Ultrafast Linkage Isomerization and Chelation Studies with Organometallics for the Development of Photochromic Materials” Ohio University, Athens, Ohio.

January 2010 “Photochromic Organometallics with Dynamic and Structural Restraints: Synthesis and Studies of Moving Targets” St. Louis University, Saint Louis, Missouri.

October 2011 “Engineering Femtosecond Chemistry for the Development of Efficient Organometallic Photochromes, University of Southern Alabama, Mobile, Alabama”

March 2013 "Why make ultrafast photochromic materials? Designing Organometallic Photochromics" Department of Chemistry, Wesleyan Illinois University, Bloomington, Illinois.

September 2013 “How to Design Organometallic Photochromes: How a Research Idea Evolves” Kentucky Lakes ACS Section Meeting, Union University, Jackson, Tennessee.

January 2015 “Photochromic Materials” Department of Chemistry, Oakwood University, Huntsville, Alabama

February 2015 “Molecular Machines Driven by Light: Photochromes and Linkage Isomerization” Department of Chemistry, Tennessee Tech University, Cookeville, Tennessee.

**Other (conferences)**

March 1979 “Thiol Addition to Carbonyl Compounds”, National American Chemical Society Meeting, Houston Texas.

June 1988 "Thermochemistry of Ligand-Exchange Reactions of Chromium Carbonyl Compounds with Aliphatic Amines Using a Photoacoustic Method", The Third Chemical Congress of North America, Toronto, Canada.

April 1989 "The Enthalpy of M-CO Dissociation in Solution (M = Cr, Mo, W) and M-Heptane Agostic Bonds", National American Chemical Society Meeting, Dallas, Texas.

September 1989 "Thermochemistry of the Oxidative Addition of Silanes to Metal Carbonyl Complexes", Symposium on Bond Energies and the Thermodynamics of Organometallic Reactions, National American Chemical Society Meeting, Miami, Fl.

April 1990 "Metal-Solvent Bond Energies for Metal Carbonyl Compounds in Weakly Coordinating Solvents", 199th National American Chemical Society Meeting, Division of Inorganic Chemistry Boston, MA.

August 1990 "Photochemistry of Metal Carbonyls in Fluorocarbon Solvent: Evidence for Delayed CO Cage Recombination", 200th National American Chemical Society Meeting, Division of Inorganic Chemistry, Washington D. C.

August 1991 "Photosubstitution of $Fe(CO)_5$ with Alkyl Phosphines: $Fe(CO)_4PR_3$ and $Fe(CO)_3(PR_3)_2$ are Single Photon Products" with S. K. Nayak, Fourth Chemical Congress of North America, New York.

April 1992 "Photosubstitution of Ironcarbonyl Phosphine Derivatives in Cyclohexane" 203rd American Chemical Society National Meeting, Division of Inorganic Chemistry, San Francisco, CA.

June 1992 "Oxidation of NTO: Potential Mechanisms Common with Thermal Decomposition", Gordon Research Conference on Energetic Materials, New Hampton School, New Hampton, NH.

July 1992 "Photoacoustic Calorimetry Studies of Chromium Pentacarbonyl Dihydrogen" 1992 Gordon Research Conference on Organometallic Chemistry, Salve Regina University, Newport, RI.

July 1992 "Photosubstitution of $Fe(CO)_5$, $Fe(CO)_4(PR_3)$, $Fe(CO)_3(PR_3)_2$." 1992 Gordon Research Conference on Organometallic Chemistry, Salve Regina University, Newport, RI.

August 1992 "Photoacoustic Calorimetry Studies of Chromium Pentacarbonyl Dihydrogen" 204th American Chemical Society National Meeting, Division of Inorganic Chemistry, Washington, D.C..

April 1993 "Photosubstitution of Ironcarbonyl Phosphine Derivative in Cyclohexane" 205th American Chemical Society National Meeting, Division of Inorganic Chemistry, Denver, CO.

August 1993 "Energetics and Kinetics of Heptane Displacement from $M0(CO)_5$(heptane)." 206th American Chemical Society National Meeting, Division of Inorganic Chemistry, Chicago, Ill.

March 1994 "Studies of $W(CO)_5$(heptane): Energetics and Kinetics of Solvent Displacement by Phosphines, Amines, Alcohols, and other Ligands." 207th American Chemical Society National Meeting, Division of Inorganic Chemistry, San Diego.

August 1994 "Intramolecular Rearrangement of $CpMn(CO)_2(HSiEt_3)$: Energetics and Kinetics of Silane Addition to $CpMn(CO)_2$." 208th American Chemical Society National Meeting, Division of Inorganic Chemistry, Washington D. C.

August 1994 "How Strong Are Metal-Alkane Bonds? Separation of Thermal and Molecular Contributions to Photoacoustic Signals Using High Pressure." Pressure" 208th American Chemical Society National Meeting, Division of Inorganic Chemistry, Washington D. C.

April 1995 "Design of Transition-Metal Complexes with High Quantum Yields for Ligand Dissociation", 209th American Chemical Society National Meeting, Division of Inorganic Chemistry, Anaheim, CA.

April 1995 "Application of Photoacoustic Calorimetry to Kinetic and Thermodynamic Studies of Silane Addition to Transition-Metal Complexes", 209th American Chemical Society National Meeting, Division of Physical Chemistry, Anaheim, CA.

November 1995 "Synthesis and Thermal Decomposition of NTO-$^{15}N_2$", 47th Southeast/51st Southwest ACS Joint Regional Meeting, Division of Organic Chemistry, Memphis, TN.

July 1996 "A Solid-Phase Thermal Decomposition Study of NTO Using Simultaneous Thermogravimetric Modulated Beam Mass Spectrometry (STMBMS)", with Leanna Minier, Richard Behrens. Gordon Research Conference on Energetic Materials, New Hampton School, New Hampton, NH.

April 1997 "Resolution of Solvent-Caged and Diffusive Reactions of $(\eta^5\text{-}C_5H_4CHCH_3)Mn(CO)_2$", 213th American Chemical Society National Meeting, San Francisco, CA. INOR-450

April 1998 Efficient Photochemical Ring Closures: Energetics and Dynamics of Reactions Following Photolysis of $(\eta^5\text{-}C_5H_4R)Mn(CO)_3$", 215th American Chemical Society National Meeting, Dallas, TX

September 1998 "An Unusual Trend in the Photochemistry of Molybdenum Hexacarbonyl in Linear Alkanes, 216th America Chemical Society National meeting, Boston, MA.

October 1999 "Ultrafast Broadband Infrared Spectroscopy of Solar Cell and Photochemical Processess, Joint meeting of the annual The Federation of Analytical Chemistry and Spectroscopy Societies and 45th International Conference on Analytical Sciences and Spectroscopy, Vancouver, B. C. Canada. Presented by Dr. Edwin J. Heilweil, collaborator.

May 1999 "Broadband Infrared Spectroscopic Investigations of Electron Transfer,Photochemistry and Biochemistry," Time-Resolved Vibrational Spectroscopy IX, Biosphere, Tuscon, AZ. Presented by Dr. Edwin J. Heilweil, collaborator.

June 1999 "Advances in FTIR Imaging and Time-Resolved Spectroscopy at NIST," OSA Topical Meeting on Fourier Transform Spectroscopy: New Methods & Applications, Santa Barbara, CA,. . Presented by Dr. Edwin J. Heilweil, collaborator.

August 1999 "Broadband Infrared Spectroscopy of Photochemical Ring Closure and Solar Cell Processes," International Conference on Photochemistry XIX, Duke University, Durham, NC. Presented by Dr. Edwin J. Heilweil, collaborator.

December 2000 "Synthesis of Cylopentadienylmanganese Tricarbonyl with a Bissulfide Side Chain" **Theodore J. Burkey**, Brian C. Holmes, and Scott Cook. Southeast/Southwest Regional America Chemical Society National meeting, New Orleans, Louisiana.

March 2000 “Application of photoacoustic calorimetry to organometallic reactions” Burkey, Ted; Jiao, Tianjie, 219th ACS National Meeting, San Francisco INOR-417.

August 2000 “Self-association reactions studied by broadband ultrafast IR spectroscopy” Heimer, Todd A.; Kleiman, Valeria D.; Burkey, Theodore J.; Heilweil, Edwin J. 220th American Chemical Society National Meeting, Washington, D. C. PHYS-163.

April 2001 “Thermochemistry, kinetics, and volumes of ligand and solvent substitution of molybdenum carbonyl complexes.” Burkey, Ted; Jiao, Tianjie; Gitterman, Shannon. , 221st American Chemical Society National Meeting, San Diego, CA INOR-100.

April 2002 “A Summer at The Interface of Theory and Experiment. The NSF-REU Site in Chemistry at The University of Memphis.” Cundari, Thomas; Parrill, Abby; Burkey, Theodore J.; Anderson, Mary, E. 223rd ACS National Meeting, Orlando, FL, CHED-144.

November 2002 “Synthesis and photochemistry of methyl cyclopentadienyl manganese carbonyl complexes” Burkey, Ted; **To, Tung T**. 54th Southeast Regional American Chemical Society Meeting, Charleston, South Carolina.

March 2003 **“**Photochromic properties of manganese and chromium complexes undergoing chelate ring closure and linkage isomerization.” **Burkey, Ted**; To, Tung T. 225th ACS National Meeting, New Orleans, LA, INOR-818.

April 2003 “Organometallic Photochromic Materials Synthesis” **Duke, Charlie**; Burkey, Ted 26th Annual Area Collegiate Chemistry Meeting, Murray, KY.

September 2003 Photoinduced dynamics of $CpMn(CO)_3$ derivatives with pendant sulfides, **Jake S. Yeston**, Tung T. To, Todd A. Heimer, Edwin J. Heilweil, Theodore J. Burkey 226th ACS National Meeting, New York, NY, INOR-654

September 2003 Ultrafast linkage isomerization as a photochromic mechanism in derivatives of cyclopentadienyl manganese tricarbonyl , **Tung T. To**, Theodore J. Burkey, 226th ACS National Meeting, New York, NY, INOR-655

September 2003 Design and preparation of cyclopentadienylmanganese tricarbonyl derivatives that undergo ultrafast ring closure upon photolysis, Tung T. To, **Theodore J. Burkey** 226th ACS National Meeting, New York, NY, INOR-700

September 2003 Synthesis of side chain derivatives of cyclopentadienyl manganese tricarbonyl and benzene chromium tricarbonyl Mohammad Al-**Masum**, Theodore J. Burkey, 226th ACS National Meeting, New York, NY, INOR-559

November 2003 “Synthesis of Arene Chromium Complexes for Photochromic Materials, **Pasano Bojang, Jr.**, Theodore J. Burkey, 55th Southeast Regional ACS Meeting, Atlanta, GA.

November 2003 "Cyclopentadienyl Manganese Complexes with Pendant Sulfides: Ultrafast Ring formation for a Molecular machine", **Theodore J. Burkey,** TungT. TO, Edwin J. Heilweil, Jake S. Yeston, Brian C. Holmes[4], Scott Cook, Todd A Heimer, 55th Southeast Reagional ACS Meeting, Atlanta, GA.

March 2004 "Synthesis and Photochemistry of Metal Arenes with Pendant Functional Groups", T. To, C. B. Duke, **Theodore J. Burkey**, 227th ACS National Meeting, Anaheim, CA, INOR-036

March 2005 "Reaction Enthalpies and Volumes for a Variety of Ligands Determined by Photoacoustic Calorimetry" **Shannon Gittermann** and Theodore J. Burkey, Midsouth Inorganic Chemistry Association Meeting, Memphis, TN.

March 2005 "Photochemical studies on a-methylthiosubstituted acetophenonechromium carbonyl complexes", **Charlie Duke** and Theodore J. Burkey, Midsouth Inorganic Chemistry Association Meeting, Memphis, TN.

March 2005 "New Photochromic Orgaometallics Based on Ultrafast Chelation of Cymantrene Derivatives with Tethered Functional Group", **Tung To** and Theodore J. Burkey, Midsouth Inorganic Chemistry Association Meeting, Memphis, TN.

March 2005 "New photochromic organometallics based on linkage isomerization of cyclopentadienyl manganese carbonyl derivatives." To, Tung T.; Burkey, Theodore J., 29th ACS National Meeting, San Diego, INOR-397.

October 2005 "Studies of Ultrafast Chelation and Linkage Isomerization: Side-chain $CpMn(CO)_3$ Derivatives as Photochromic Devices", Tung T. To, Edwin Heilweil, Charlie Duke, **Theodore J. Burkey** Joint Southwest/Southeastern Regional Meeting of the American Chemical Society, Memphis, TN.

October 2005 "Determination of Rates, Enthalpies, and Volumes of Organometallic Reactions using Photoacoustic Calorimetry", **Shannon M. Gittermann**, Tianje Jiao, Ging-Long Leu, Theodore J. Burkey, Joint Southwest/Southeastern Regional Meeting of the American Chemical Society, Memphis, TN.

August 2006 "Ultrafast Chelation Dynamics of Model Photoswitches: Cyclopentadienyl Manganese and Arene Chromium Tricarbonyl Derivatives with Pendant Sulfides" **Tung T. To,** Charles B. Duke III, Theodore J. Burkey, and Edwin J. Heilweil, 15th International Conference on Ultrafast Phenomena in Pacific Grove, CA.

March 2006 "Studies of tricarbonyl(methylcyclopentadienyl)manganese side-chain derivatives that undergo ultrafast chelation." **Burkey, Theodore J.**; To, Tung T.; Gittermann, Shannon; Duke, Charles B. 231st ACS National Meeting, Atlanta, INOR-426.

March 2006 "Time-resolved infrared absorption study of cyclopentadienyl manganese tricarbonyl derivatives: Chelation with pendant sulfides in acetonitrile." **To, Tung T.**; Burkey, Theodore J.; Heilweil, Edwin J. 231st ACS National Meeting, Atlanta, INOR-809.

March 2006 "Study of tricarbonyl manganese cyclopentadienyl sulfides using time-resolved infrared spectroscopy: Solvation effects on chelation." **To, Tung T.**; Burkey, Theodore J.; Heilweil, Edwin J. 231st ACS National Meeting, Atlanta, PHYS-290.

November 2006 "Synthesis of Photochromic Organometallic Cyclopentadienyl Manganese Tricarbonyls", **Christopher S. Junker**, Casey M. O'Brien, Charlie B. Duke and Theodore J. Burkey, 58th Southeastern Regional Meeting of the American Chemical Society, Augusta, GA

August 2007 "Synthesis and ultrafast chelation dynamics of organomanganese and organochromium complexes", **To, Tung T**.; Duke, Charles B.; Burkey, Theodore J.; Heilweil, Edwin J**.** 234th ACS National Meeting, Boston, MA, , PHYS-324

August 2007 "Preparation and studies of the first organometallic chromium system that is photochromic and bistable", **Burkey, Theodore J.**; Duke, Charles B.; To, Tung T.; Heilweil, Edwin J. 234th ACS National Meeting, Boston, MA, , INOR-846.

November 2008 "Ultrafast Time Resolved Infrared Spectroscopy of Photochromic Cyclopentadienyl Manganese Tricarbonyl Derivatives", . Heilweil, Edwin J.; Mosley, Karen L.; Webster, Charles Edwin; Ruddick, Kristie**; Burkey, Theodore J.** 60th Southeast Regional Meeting of the American Chemical Society, Nashville, TN. SERM-106

November 2008 "Synthesis and Photochemistry of New Photochromic Organometallics", Mosley, Karen L.; Ruddick, Kristie; Webster, Edwin; Heilweil, Edwin J.; Burkey, Theodore J.. 60th Southeast Regional Meeting of the American Chemical Society, Nashville, TN. SERM-409

March 2009 "Photochromic cyclopentadienyl manganese tricarbonyl derivatives: Studies of linkage isomerization and ultrafast time resolved infrared spectroscopy", Heilweil, Edwin J.; Mosley, Karen; Ruddick, Kristie R.; Webster, Charles Edwin; Burkey, Theodore J. Abstracts of Papers, 237th ACS National Meeting, Salt Lake City, UT, United States, INOR-435.

March 2009 "Computational and experimental studies of organometallic photochromic systems: Isomerization mechanisms for bifunctional side-chain complexes." Ruddick, Kristie R.; Burkey, Theodore J.; Webster, Charles Edwin. Abstracts of Papers, 237th ACS National Meeting, Salt Lake City, UT, United States, INOR-670.

May 2009 "Synthesis and Photochemistry of Novel Organometallics". Mosley, Karen L.; Ruddick, Kristie; Webster, Charles Edwin; Heilweil, Edwin J.; Burkey, Theodore J Abstracts, 38th Great Lakes Regional Meeting of the American Chemical Society, Chicago, IL, United States, GLRM-227.

May 2009 **"**Computational Design of Organometallic Photochromic Systems." Ruddick, Kristie; Mosley, Karen L.; Burkey, Theodore J.; Webster, Charles Edwin. Abstracts, 38th Great Lakes Regional Meeting of the American Chemical Society, Chicago, IL, United States, GLRM-229.

May 2009 "Ultrafast Linkage Isomerization and Chelation Studies with Organometallics for the Development of Photochromic Materials" Ohio University, Athens, Ohio.

January 2010 "Photochromic Organometallics with Dynamic and Structural Restraints: Synthesis and Studies of Moving Targets" St. Louis University, Saint Louis, Missouri."

February 2010 "Designing Organometallic Molecules that Behave Like Machines: Creating Function Amid Chaos" Plenary Speaker, 30th Annual Undergraduate Research Conference, Department of Chemistry University of Memphis. Memphis, Tennessee.

August 2010 "Photochromic cyclopentadiene manganese tricarbonyl derivatives: Participation of imine group during linkage isomerization", **Ted J. Burkey**, Karen L. Mosley, Prof. C. Edwin Webster, Kristie R. Ruddick, Philippe P. Lubet, Jermaine O. Johnson, Dr. Edwin J. Heilweil, 240th ACS National Meeting & Exposition. August 22-26, 2010, Boston, Massachusetts. Inorganic 652.

August 2010 "Synthesis of new photochromic organometallics based on a linkage isomerization" **Karen L Mosley,** Kristie R Ruddick, Jermaine O Johnson, Dr. Charles E Webster, Dr. Theodore J. Burkey, 240th ACS National Meeting & Exposition, Boston, Massachusetts. Inorganic 567.

August 2010 "Computational design of organometallic photochromic systems with chelating, bifunctional tethered side chains", **Charles Edwin Webster**, Kristie R. Ruddick, Karen L. Mosley, Jermaine O. Johnson, Philippe P. Lubet, Theodore J. Burkey, 240th ACS National Meeting & Exposition, Boston, Massachusetts. Computational 331.

March 2011 **"**Potential characteristics and proposed synthesis of a predicted photochromic isomeric pair." Thomas Pangia,; Theodore Burkey, 241st ACS National Meeting & Exposition, Anaheim, CA, United States, INOR-614.

March 2012 "Preparation and photochemistry of cyclopentadienyl manganese tricarbonyl derivatives with pendant hydrazone and pyridine groups" **Theodore J**. **Burkey,** Edwin J. Heilweil, Jermaine O. Johnson, Karen L. Mosley, Philippe P. Lubet, Charles E. Webster, 243rd ACS National eeting&Exposition, San Diego, CA, INOR-1001

March 2012 "Synthetic, structural, photochemical, and thermochemical studies of arene chromium tricarbonyl complexes with tethered pyridine groups",**Theodore J. Burkey,** Charles B. Duke, Roger G. Letterman, , Charles R. Ross, Charles E. Webster, 243rd ACS National Meeting & Exposition, San Diego, CA, United States, INOR-1000.

August 2012 "How do inequivalent atoms in an organometallic complex become equivalent on the NMR timescale" **Roger G**. **Letterman,** Charles B. Duke, Tung T. To, Theodore J. Burkey, Charles E. Webster, 244th ACS National Meeting & Exposition, Philadelphia, PA, INOR-354.

August 2012 "Should density functional theory be used to guide the design of chromium-containing photochromic materials?", **Roger G. Letterman,** Nathan J. DeYonker, Theodore J. Burkey, Charles E. Webster, 244th ACS National Meeting & Exposition, Philadelphia, PA. INOR-224.

April 2013 "Synthesis and Properties of Organometallic Photochromes Based on ($\eta^5$-Cyclopentadienyl)$Mn(CO)_3$ and ($\eta^5$-Pentalenyl)$Mn(CO)_3$ Complexes" **Jermaine O. Johnson**, Karen L. Mosley, Roger G. Letterman, Philippe P. Lubet, Theodore J. Burkey, Charles E. Webster New Orleans 245th ACS National Meeting & Exposition, New Orleans, LA, United States, INOR-731.

April 2013 "Design of Organometallic Photochromes: Utilizing Linkage Isomerization in the Production of Ultrafast Devices" Edwin J. Heilweil, **Theodore J. Burkey**, Jermaine O. Johnson, Roger G. Letterman, Charles Edwin Webster 245th ACS National Meeting & Exposition, New Orleans, LA, United States, INOR-774.

April 2013 "Designing and engineering organometallic photochromic systems with chelating, bifunctional tethered side-chains", Charles E. Webster, Roger G Letterman, James W. Barr, Johnson, Jermaine O.; McFadden, Thomas M.; Duke, Charles B.; To, Tung T.;**Burkey, Theodore J.** 245th ACS National Meeting & Exposition, New Orleans, LA, United States, INOR-1086

March 2014 "Synthesis and Characterization of ($\eta^5$-Pentalenyl)$Mn(CO)_2$ Complexes with Tethered Functional Groups: Development of Organometallic Photochromes" **Johnson, Jermaine O**.; Letterman, Roger G.; Heilweil, Edwin J.; Webster, Charles E.; Burkey, Theodore J. 247th ACS National Meeting & Exposition, Dallas, TX, United States, March 16-20, 2014 (2014), INOR-286.

March 2014 "Organometallic Complexes with Tethered Hydrazone and Pyridyl Ligands as Model Photochromic Complexes: A Density Functional Theory Study" Letterman, Roger G.; Johnson, Jermaine O.; Burkey, Theodore J.; Webster, Charles E. 247th ACS National Meeting & Exposition, Dallas, TX, United States, March 16-20, 2014, INOR-709.

March 2014 "Synthesis and Quantum Yields of Organometallic Photochromes**" Vailonis, Kristina**; Burkey, Ted**,** 247th ACS National Meeting & Exposition, Dallas, TX, United States, March 16-20, 2014, CHED-809.

June 2014 Breaking and Making Bonds with Light, Meeting Organizers: Jeff Rack, **Ted Burkey**, Edwin Webster, Telluride Science Research Center, June 30-July 4, 2014, Telluride, Colorado.

June 2014 "Picosecond and Longer Infrared Measurements of Organometallic Photochemical Dynamics" **Brian Alberding**, Ted Heilweil, Jermaine Johnson, Ted Burkey, Breaking and Making Bonds with Light, Telluride Science Research Center, June 30-July 4, 2014, Telluride, Colorado.

June 2014 "Tailoring linkage Isomerization to Obtain Ultrafast Organometallic Photochromes" Ted Burkey, Breaking and Making Bonds with Light, Telluride Science Research Center, June 30-July 4, 2014, Telluride, Colorado.

September 2014 "Design and Performance of Ultrafast Organometallic Photochromes" **Ted Burkey**, Jermaine Johnson, Edwin Heilweil, Charles Edwin Webster, Thomas McFadden, Brian Alberding, 41st Annual NOBCChE Conference, New Orleans, Louisiana, September 23-26, 2014.

September 2014 "Design and Synthesis of Organometallic Photochromes based on ($\eta^5$-Pentalenyl)$Mn(CO)_3$ Complexes" Jermaine O. Johnson, Roger G. Letterman, Edwin J. Heilweil, Charles Edwin Webster, **Theodore J. Burkey**, 41st Annual NOBCChE Conference, New Orleans, Louisiana, September 23-26, 2014.

## SUPPORT: *(Use Appendix D to provide additional information as needed.)*

| EXTERNAL (Funded or Pending. List funded support first) | AGENCY/SOURCE | AMOUNT | PERIOD |
|---|---|---|---|
| Studies of Non-Covalent Bonds Between Coordinatively-Unsaturated Metals and Saturated Compounds | PRF-ACS Type G | $18,000 | 9/87- 8/89. |
| Photoacoustic Calorimetry, ESR, and DSC Studies of NTO | Universal Energy Systems/Air Force Office of Scientific Research | $25,227 | 1/91 - 8/91 |
| Studies of Weak Interactions with Metal Centers | ACS-PRF Type G Grant Supplement | $3,000 | 8/91-9/91 |
| Studies of Weak Interactions with Metal Centers. | ACS-PRF Type AC | $40,000 | 1/91 - 8/93 |
| Studies of NTO Decomposition | RDL/AFOSR Research Initiation Program | $29,687 | 1/93-12/93 |
| High Pressure Photoacoustic Calorimetry | National Science Foundation | $30,000 | 1/93-7/94 |
| Hydrogen Activation by Transition Metal Complexes | ACS PRF Type AC | $53,000 | 6/95-8/97 |
| Sponsor for Outstanding Undergraduate Research | Ideal Chemical | $500 | 2/97 |
| Sponsor for Outstanding Undergraduate | Schering Plough | $500 | 2/97 |

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|---|---|---|---|
| Research | | | |
| Sponsor for Outstanding Undergraduate Research | American Cyanamid | $500 | 2/97 |
| Renovation of J. M. Smith Chemistry Building at The University of Memphis" with Cundari, T. R.; Li, Y. S.; Kurtz, H. A. | National Science Foundation | $105,991 | 11/96-8/98 |
| Studies at the Interface of Theory and Experiment with, Parrill, A.; Cundari, T. R.; Bridson, P.; Kurtz, H. A.; Peters, G. | National Science Foundation | $103,363 | 2/00-1/03 |
| Design of Organometallic Molecular Machines | National Science Foundation | $97,000 | 6-/02-6/03 |
| Ultrafast Infrared Studies of Linkage Isomerization | National Institute of Science and Technology | $14,925 | 6/04–12/04 |
| Project SEED, research experience for economically disadvantaged high school students | Cargill, Ciba, Buckman, Schering Plough, ACS | $4550 | 5/05-9/05 |
| Acquisition of a 400 MHz NMR Spectrometer for Research and Graduate Research Training (Co-PI with Abby Parrill) | National Science Foundation | $262,500 | 3/05-9/06 |
| Project SEED | Cargill, Buckman, Schering Plough, ACS | $11,075 | 5/06-9/06 |
| Project SEED | Buckman, Cargill, Schering Plough Valero, ACS | $13,500 | 5/07-9/07 |
| Project SEED | Buckman, Cargill, Schering Plough Valero, ACS | $13,000 | 5/08-9/08 |
| Access and Diversity Initiative | Tennessee Board of Regents | $13,800 | 2/08-3/09 |
| Project SEED | Buckman, Schering Plough, Valero, ACS | $13,000 | 5/09-9/09 |
| Project SEED | Buckman, GlaxoSmithKline, ACS | $14,500 | 5/10-9/10 |
| Project SEED | BASF, Buckman, GlaxoSmithKline, ACS | $13,700 | 5/11-9/11 |
| Development of Organometallics for Ultrafast Photoswitches via Linkage Isomerization | National Institute of Science and Technology | $72,236 | 7/08–6/10 |
| Project SEED | BASF, Buckman, GlaxoSmithKline, ACS | $12,500 | 5/12-9/12 |
| Spectroscopic Material Identification Center | DOE-NVESD Subcontract | $100,900 | 8/09-7/12 |
| Ultrafast dynamics, mechanism, and linkage isomerization of photosensitive organometallic manganese and chromium complexes | National Science Foundation (with Webster) | $390,000 | 8/09-7/12 |
| Project SEED | BASF, Buckman, ACS | $7,500 | 5/13-9/13 |
| Project SEED | BASF, Buckman, ACS | $12,500 | 5/14-9/14 |
| Probes for Cage Reactions of Organometallic Complexes | National Science Foundation (with Webster) | $761,960 | pending |
| MRI: Acquisition of 400MHz NMR Spectrometer | NSF with Baker, Fujiwara, Zhao | $412,528 | pending |

| INTERNAL | SOURCE | AMOUNT | PERIOD |
|---|---|---|---|
| Reaction of Thiols with Anticancer Drugs | MSU Faculty Research Grant | $3000 | 2/86 |
| Studies of Steric Interactions of Transition Metal Compounds | MSU Faculty Research Grant | $2,930 | 3/87. |
| Quantum Yields of Metal Complexes | MSU Faculty Research Grant | $2,900 | 10/88 |
| SPUR (Superior Performance in University Research) | MSU | $2000 | April 1992 |
| Measurements of Quantum Yields at High Pressures | MSU Faculty Research Grant | $3000 | 6/92 |
| Design, Preparation, and Characterization | Faculty Research Grant, The | $4000 | 7/98-5/99 |

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|---|---|---|---|
| of Photochromic Materials | University of Memphis | | |
| Volume of Reaction Calculations for PAC Studies | Faculty Research Grant, The University of Memphis | $4000 | 8/01-7/02 |
| Methods for Producing Online Lectures for a Technical Course | Internet2 Technology Access Fee (TAF) Awards | $10,000 | 7/02-3/03 |
| Application of Digital Video in Technical Lecture and Laboratory Courses | INTERNET2 TECHNOLOGY ACCESS FEE (TAF) AWARDS | $10,000 | 8/03-12/04 |
| Building a U of M NOBCChE Chapter | Provost, A&S, Chemistry | $14,250 | 9/04-8/08 |
| First Tennessee Professorship Award | First Tennessee Foundation | $15,000 | 9/08-8/11 |

## OUTREACH: *(Project/s summarized as needed in Appendix E.)*

| PROJECT | PARTICIPANTS | PERIOD | SPONSORSHIP (if any) |
|---|---|---|---|
| Gas Chromatography | Ideal Chemical Company | 3/96-4/96 | |
| Project SEED | Memphis City High School Students | 5/05-8/13 | American Chemical Society, Glaxo Smithkline, Cargill, Schering Plough, Buckman, Ciba Specialty, Valero |

## SERVICE:

| UNIVERSITY | COMMITTEE/ACTIVITY (if Chair, add [C]) | PERIOD |
|---|---|---|
| **Department** | **Facilities Committee [C]** | **6/02-now** |
| | Organic Cumulative Exam Committee | 9/85-now |
| | Chemistry Department Equipment Committee | 90- |
| | Faculty Search Committee, Chair | 91-92, 04-05, 07-08 |
| | Faculty Search Committee | 87-88, 89-90, 90-91, 91-92, 96-97,98-99, 00-01, 04-05, 06-07 |
| | Maintenance of Glass Blowing Shop | 9/86 – 9/00 |
| | Library Coordinator | 9/85-8/90, 9/97-9/00 |
| | Maintenance of Mattson FT IR Spectrometer | 9/94 –9/98 |
| | Manager of JEOL NMR Spectrometer | 1/92 - now |
| | Graduate Studies Committee | 9/93-8/96 |
| | Director, 15th and 16th Annual University of Memphis Undergraduate Research Conference | 3/95, 2/96 |
| | Chair, Planning Committee | 1996-97 |
| | Chair, Tenure and Promotion Committee | 1998-99, 2010-2011 |
| | Chair, Facilities Committee | 2000-now |
| | Installation of 500 MHz NMR | 2005 |
| | Manager and Training 500 MHz NMR | 2006-now |
| **College/School** | Writing-across-the-University | Fall 89 |
| | Tenure and Promotion Committee | 90-91 |
| | Committee for Master Plan | 96-97 |
| | Arts and Sciences Technology Access Committee | 2003-2005 |
| | External Chair, Committee for Department of Earth Sciences Chair Evaluation | 2007 |
| **University** | Mathematics, Engineering, Science Proposal Review Committee | Spring 97 |
| | Graduate Task Force Committee | Spring 1999 |
| | University T & P Appeals Committee | Spring 2004-6 |
| | Personal Response System RFP Evaluation Committee | Fall 2006/Spring 2007 |
| | Faculty T&P Appeal Advocate (2010 Bicard) (2011 Gabikagojeaskoa) (2012 Aggarwal, Mathur, Mulroy) | 2009-2012 |
| | Conflict of Interest Committee | 2011-2013 |

| OTHER Society/Organization /Journal | COMMITTEE/EDITORIAL BOARD/OFFICE (if Chair, add [C]) | PERIOD |
|---|---|---|

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|---|---|---|
| ACS-PRF | Proposal referee | 9/91, 5/95, 8/96, 11/96, 1/98, 10/01, 5/03, 7/07, 3/08, 9/10, 3/11, 5/11, 9/13 |
| ACS Symposium Series | manuscript referee | 11/89 |
| American Chemical Society | Member | 1/77-now |
| American Chemical Society | SW/SE Regional Meeting, Graduate School Fair Coordinator | 11/05 |
| Cottrell | Proposal referee | 3/09 |
| Coordination Chemistry Reviews | manuscript referee | 11/09 |
| Inorganic Chemistry | manuscript referee | 8/91, 6/92, 11/95, 6/96, 6/96, 10/97, 11/97, 2/98, 4/98, 8/99, 7/00 |
| Journal of Organic Chemistry | manuscript referee | 6/86, 1/87, 9/87, 5/88, 11/88, 12/88, 1/97, 9/97, 12/97, 9/03 |
| Journal of the American Chemical Society | manuscript referee | 9/89, 1/90, 3/91, 3/91, 3/91, 10/92, 6/93, 1/94, 1/94, 7/94, 1/95,10/02, 6/03, 6/03, 8/03, 12/03, 8/07, 12/08, 12/09, 9/13, 10/13 |
| Journal of Coordination Chemistry | manuscript referee | 2/02, 2/03, 8/03, 12/03, 10/06, 8/07, 3/11, 6/11 |
| Journal of Organometallic Chemistry | manuscript referee | 3/90, 4/97, 5/98, 5/08 |
| J. Photochemistry and Photobiology A | manuscript referee | 10/05, 12/07 |
| Journal of Physical Chemistry | manuscript referee | 8/96,7/99, 9/99,11/01, 3/02, 6/02, 7/02, 6/03, 8/03, 9/03, 10/06, 8/10,9/10, 1/11, 2/12 |
| Memphis Section, American Chemical Society | Executive Committee member | 1/93-12/95 |
| NATO ASI Series | manuscript referee | 9/91 |
| NSF | Proposal referee | 4/94/, 9/94, 5/01,2/03, 2/04, 5/04, 6/04, 2/07,10/07,5/08, 10/08, 4/09, 10/09, 11/09, 3/11, 5/11 2/15 |
| Organometallics | manuscript referee | 11/89, 10/91, 1/92, 7/93, 5/00, 6/00, 8/02, 12/03, 12/06, 5/07, 5/08, 6/08, 10/08, 12/08, 12/09, 4/10, 5/11, 7/11, 9/11, 3/12, 2/13, 7/13, 11/13, 12/13, 2/14 5/19 |
| Structural Chemistry | manuscript referee | 11/00 |
| Synthesis and Reactivity in Inorganic and Metal-Organic Chemistry | manuscript referee | 6/95, 9/95, 4/97, 6/98 |
| | External review of T&P portfolio | 9/07 |
| NOBCChE | Member, Chapter advisor | 9/04-now, 9/04-8/10 |

| | | |
|---|---|---|
| Telluride Science Research Center | Co-Organizer, “Making and Breaking Bonds with Light” | 2012 |

## CONSULTING: *(Optional)*

| ORGANIZATION/COMPANY | PERIOD |
|---|---|
| Williams, McDaniel, Wolfe | Spring 99 |
| Williams, McDaniel, Wolfe | Spring 93 |
| Apperson, Crump, Duzane, Maxwell | 9/96- 3/1/97 |
| Consultant: Causey, Walker and Markowitz | 10/05 |

# APPENDIX B

**High School SEED students**: Jordan Jackson (2012),Mathew Gude (2011) Diamond Wallace, Charika Williams (2010) Darius Hankins (2009) Shanethia Rucker (2008) London Lamar, Corderius Muse (2007) Timothy Howze (2007) Chris McNeary (2005)

**Undergraduate Student Research**: Angela Link (1986) Jim Morse, Greg Parker and David Robbins (1989) Don Bobal (1991) Tabitha Hughes (1993) Brian Holmes, Scott Cook, and Shannon Gittermann (2000) Tim Roberts, Dawne McNair and Robert White (2001) Misty Funk, Johnny Giles, and Leo Sieben (2002) Pasano Bojang (2003) Leslie Tiensveld (2004) Melinda Jansen and Nick Mayhall (2005) Jeffrey Swan (2006) Casey Obrien (2006) Chris Junker (2006) Veronica Shields (2009) Parker Hemphill (2010) Thomas Pangia (2010/11) Aaron Schulzetenberg (2011) Alicia? (2012)

**MS students:** Perry Fan (1993) Ging-Long Leu (Shiny Chemical, 1994) Songnan Hu (Eastern Trading & Consulting Co., 1996) Tianjie Jiao (Barr Laboratories, 1999), Tung To (2003) Charlie Duke (2004) Philippe Lubet (2012),

**PhD students:** Suresh Nayak (1992) David Burney (Triarca, 1994) Perry Fan (Abbot Laboratories, 1995) Zhen Pang (University of Shanghai, 1995) Tung To (NIST, 2005), Shannon Gittermann (2007) Charlie Duke (2009). Karen Mosley (2012), Jermaine Johnson (2013) Thomas McFadden (2016) Margaret Owens (2017)

Postdoctoral fellow: Gerard Farrell (1995), Mohammad Al-Masum (2002-2004)

Current Committee: Roger Letterman, Min Zhang, Brandon Gindt, Chailu Que 2014, Teera Baine 2014

**Proposals submitted but not funded**

| title | dates | agency | amount |
|---|---|---|---|
| | | | |
| Ultrafast dynamics, mechanism, and linkage isomerization of photosensitive organometallic manganese and chromium complexes | 7/08-6/11 | NSF | $543,255 |
| Studies of Ultrafast Chelation and Linkage Isomerization | 9/05-8/08 | PRF | $120,000 |
| Studies of Ultrafast Chelation and Linkage Isomerization | 6/05-5/08 | NSF | $393,854 |
| Temporal Constraints of Ring Formation | 1/05–8/08 | PRF | 120,000 |
| Development of Ultrafast Photochromic Organometallic Compounds | 6/04–5/07 | NSF | 433,526 |
| Instruction Model for Emerging Non-traditional Students: An Integrated Multimedia Course (Eugene Pinkhassik, Co-PI) | 1/04–12/04 | Dreyfus | 30,064 |
| REU Site: Chemistry Through Collaboration (Minor PI with A. Parrill and G. Peters) | 7/03–6/06 | NSF | 99,570 |
| Acquisition of a 500 MHz NMR Spectrometer for Research and Graduate Research Training (minor PI with A. Parrill) | 7/03 | NSF | 345,000 |
| Structural Characterization of Lipid Phosphate Phosphohydrolases (Minor P.I, with A. Parrill) | 7/03–6/07 | NSF | 623,813 |
| Design of Reversible and Ultrafast Optically-Driven Ring Closure | 6/03–5/06 | NSF | 425,517 |
| Acquisition of a 500 MHz NMR Spectrometer for Research and Graduate Research Training (minor PI with A. Parrill)) | 1/03 | NSF | 427,000 |
| Ultrafast Organometallic Machines | 1/03–8/06 | PRF | 120,000 |
| Ultrafast Organometallic Machines | 5/02–4/05 | NSF | 532,529 |
| Acquisition of a 600 MHz NMR Spectrometer for Research and Graduate Research Training (with other faculty) | 1/02 | NSF | 623,000 |
| Studies of Weak Metal-Solvent Interactions | 5/00–8/03 | PRF | 90,000 |
| Studies of Photoefficient Organometallic Materials | 6/99–8/02 | PRF | 90,000 |
| Preparation and Characterization of Organometallic Compounds with High Quantum Yields | 9/98–8/01 | PRF | 90,000 |
| Organic Materials for Optical Memory (white paper) | 1/98–12/00 | DOD | 412,600 |
| Design of Compounds with High Quantum Yields and Photochromic | 9/97– | NSF | 102,160 |

| | | | |
|---|---|---|---|
| Properties | 8/00 | | |
| Application of PAC to Organometallic Chemistry | 9/95–8/98 | NSF | 265,390 |
| Hydrogen Activation by Transition Metal Complexes | 1/95–12/97 | DOE | 208,239 |
| Energetics of Small Molecule Activation by Transition Metal Complexes | 9/93–8/96 | PRF | 75,000 |
| Energetics of Small Molecule Activation by Transition Metal Complexes | 1/94–12/96 | DOE | 276,376 |
| Instrument grant for ESR (Minor PI) | 3/94 | NSF | 110,000 |
| Studies of NTO Decomposition | 1/94–12/96 | AFOSR | 263,554 |
| Instrument Grant for ESR (minor PI) | 12/92 | NSF | 171,027 |
| Instrument Grant for ESR (minor PI) | 4/92 | NSF | 171,027 |
| Undergraduate Research in Chemistry and Instrumentation (minor PI) | 6/92–8/94 | NSF | 120,000 |
| Studies of Weak Interactions with Metal Centers | 5/91–8/93 | PRF | 40,000 |
| Undergraduate Research in Chemistry and Instrumentation (minor PI) | 6/91–8/93 | NSF | 120,000 |
| Binding and Activation of Alkanes by Metal Centers | 6/91–5/94 | DOE | 354,977 |
| Investigation of Electronic Effects on Catalytically Important Processes (with R. Johnston) | 7/90–5/94 | NSF | 252,312 |
| Studies of Weak Activation of Carbon-Hydrogen Bonds | 6/90–5/93 | DOE | 247,772 |
| Studies of Intermolecular Agostic Bonds | 5/90–8/93 | PRF | 60,000 |
| Enhanced Methane Reactivity (with R. Johnston) | 1/90–12/93 | GRI | 382,333 |
| Studies of Homogeneous Catalysis using Cyclopentadienyl Complexes (with R. Johnston) | 1/90–12/93 | NSF | 190,000 |
| Investigation of Electronic Effects on Catalytically Important Processes (with R. Johnston) | 9/89–8/92 | P&G | 150,000 |
| Thermochemistry of Metal-Inert Solvent Interactions and Metal-Ligand bonds | 9/86–8/88 | PRF | 18,000 |